

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A layered article of manufacture, comprising a substrate; a biaxially textured MgO crystalline layer having the c-axes thereof inclined with respect to the plane of the substrate; a layer of one or more of YSZ or  $Y_2O_3$ ; a layer of  $CeO_2$ ; and a crystalline superconductor layer, said crystalline superconductor having the c-axes thereof normal to said substrate.
2. The article of manufacture of claim 1, wherein said substrate is metallic or a ceramic.
3. The article of manufacture of claim 2, wherein said biaxially textured MgO layer is directly in contact with said metallic substrate and the c-axes of said MgO layer are inclined up to about  $40^\circ$  from said metallic substrate normal.
4. The article of manufacture of claim 3, wherein the c-axes of said MgO layer are inclined between about  $20^\circ$  and about  $35^\circ$  with respect to said substrate normal.
5. The article of manufacture of claim 3, wherein said YSZ layer is directly in contact with said biaxially textured MgO layer and substantially coextensive therewith.
6. The article of manufacture of claim 5, wherein said  $CeO_2$  layer is directly in contact with said YSZ layer and substantially coextensive therewith.
7. The article of manufacture of claim 6, wherein said crystalline superconductor layer is directly in contact with said  $CeO_2$  layer and is selected from the family of YBCO superconductors.

8. The article of manufacture of claim 7, wherein said metallic substrate is a Ni alloy.

9. The article of manufacture of claim 8, wherein said metallic substrate is non-biaxially aligned.

10. The article of manufacture of claim 1, wherein said substrate is a tape.

11. The article of manufacture of claim 1, wherein said substrate is arcuate.

12. The article of manufacture of claim 11, wherein said substrate is a wire.

13. A layered article of manufacture, comprising a metallic substrate; a biaxially textured MgO crystalline layer on said metallic substrate, said MgO having the c-axes thereof inclined with respect to the normal to the substrate in the range of from about  $10^\circ$  to about  $40^\circ$ ; a layer of one or more of YSZ or  $Y_2O_3$  on said MgO crystalline layer; a layer of  $CeO_2$  on said layer of one or more of YSZ or  $Y_2O_3$ ; and a crystalline superconductor layer on said  $CeO_2$  layer, said crystalline superconductor having the c-axes thereof normal to said metallic substrate.

14. The article of claim 13, wherein said biaxially textured MgO crystalline layer is up to about 2 microns thick.

15. The article of claim 13, wherein said YSZ or  $Y_2O_3$  layer is up to about 1 micron thick.

16. The article of claim 13, wherein said  $CeO_2$  layer is up to about 30 nanometers thick.

17. The article of claim 13, wherein said crystalline superconductor is selected from the family of YBCO superconductors.

18. The article of claim 13, wherein said substrate is arcuate.

19. The article of claim 13, wherein said biaxially textured MgO crystalline layer is directly in contact with said metallic substrate and having a homoepitaxial layer of MgO thereon and said YSZ layer in contact with said homoepitaxial layer of MgO and is up to about 2 microns thick, said YSZ layer is in direct contact with said  $\text{CeO}_2$  layer and is up to about 1 micron thick, said  $\text{CeO}_2$  layer is in direct contact with said superconductor layer and is up to about 30 nanometers thick, and said crystalline superconductor is selected from the family of YBCO superconductors.

20. The article of claim 19, wherein the c-axes of said crystalline MgO layer are inclined from about  $20^\circ$  to about  $35^\circ$  with respect to the normal to said metallic substrate.

21. The article of claim 13, wherein said article is a tape.

22. The article of claim 13, wherein said article is a wire.

23. A method of making a layered article of manufacture, comprising providing a substrate; depositing a biaxially textured MgO crystalline layer on the substrate by the inclined substrate deposition (ISD) method, the MgO having the c-axes thereof inclined with respect to the substrate normal; depositing a layer of one or more of YSZ or  $\text{Y}_2\text{O}_3$  on the biaxially textured MgO crystalline layer; depositing a layer of  $\text{CeO}_2$  on said layer of one or more of YSZ or  $\text{Y}_2\text{O}_3$ ; and depositing a crystalline superconductor layer on the  $\text{CeO}_2$  layer, the crystalline superconductor having the c-axes thereof normal to the substrate.

24. The method of claim 23, wherein at least some depositions are carried out by the pulsed laser deposition method.

25. The method of claim 23, wherein the plume of the MgO ions are inclined between about  $25^{\circ}$  and about  $70^{\circ}$  with respect to the plane of the substrate normal.

26. The method of claim 23, wherein the angle of the plume of MgO ions inclined  $35^{\circ} \pm 10^{\circ}$  or  $60^{\circ} \pm 10^{\circ}$  with respect to the substrate normal.

27. The method of claim 25, wherein relative rotational movement is provided between the substrate and the source of one or more layers.

28. The method of claim 27, wherein the substrate is rotated during at least some of the depositions to produce a wire.

29. The method of claim 23, wherein the YSZ and/or the  $\text{CeO}_2$  layer is deposited by a method other than ISD.

30. The method of claim 23, wherein the YSZ and/or the  $\text{CeO}_2$  layer is deposited by ISD.